WHAT IS CLAIMED IS:

1. An apparatus for screening materials in an array comprising:
   a) a cell comprising a first portion and a second portion, said cell having a fluid inlet and at least one fluid outlet and said first portion defining a passage;
   b) a window positioned within the cell adjacent the first portion and in alignment with the passage;
   c) a fluid permeable array support spaced apart from, and in alignment with, the window;
   d) a semipermeable membrane adjacent the array support; and
   e) said fluid inlet and one fluid outlet positioned on opposite sides of the combination of the array support and the semipermeable membrane.
2. The apparatus of Claim 1 further comprising a heat source in alignment with the window.
3. The apparatus of Claim 1 further comprising a detector in fluid communication with the fluid outlet.
4. The apparatus of Claim 1 further comprising at least one fastener connecting the first portion and the second portion of the reaction cell.
5. The apparatus of Claim 1 further comprising a seal positioned within the reaction cell between the first portion of the cell and the window.
6. The apparatus of Claim 1 further comprising a spacing support positioned between the window and the array support.
7. The apparatus of Claim 6 wherein the spacing support is a toothed support.
8. The apparatus of Claim 1 wherein the array support and the semipermeable membrane are comprised of different materials.
9. The apparatus of Claim 1 further comprising at least one heater in contact with the cell.

10. The apparatus of Claim 1 wherein the fluid inlet and one fluid outlet are located in the first portion of the cell while a second fluid outlet is located in the second portion of the cell.

11. The apparatus of Claim 1 wherein the cell contains two fluid outlets where the fluid outlets are on opposites sides of the combination of the array support and the membrane.

12. The apparatus of Claim 1 further comprising a membrane support positioned within the cell adjacent to the semipermeable membrane.

13. The apparatus of Claim 2 wherein the heat source is a radiation source.

14. The apparatus of Claim 3 wherein the detector is a mass spectrometer.

15. The apparatus of Claim 14 wherein the mass spectrometer is a quadrupole mass spectrometer.

16. The apparatus of Claim 1 wherein the semipermeable membrane is hydrophobic.

17. The apparatus of Claim 16 wherein the semipermeable membrane is silicone rubber.

18. The apparatus of Claim 1 further comprising a dispersion structure positioned between the fluid inlet and the array support.

19. The apparatus of Claim 1 wherein the array support is selected from the group consisting of carbon paper and alumina.

20. The apparatus of Claim 1 further comprising a calibration port located between the fluid outlet and the detector.

21. The apparatus of Claim 3 wherein the detector is connected to a microprocessor.

22. The apparatus of Claim 2 wherein the heat source is connected to a microprocessor.

23. A process for screening an array of materials comprising:

a) containing the array of materials within a cell and in alignment with a window in the cell;

b) contacting the array of materials with a feed fluid while sequentially selectively heating each of the materials in the array by impinging radiation that is passed through the window onto the selected material to form an effluent corresponding to the heated material;

c) separating each effluent, by flowing each effluent sequentially through a semipermeable membrane to form sequential sample streams; and

d) detecting at least one component of the sequential sample streams.

24. The process of Claim 23 wherein the heating is impinging radiation from a laser on the selected material.

25. The process of Claim 24 wherein the laser is defocused to impinge the radiation on the surface of the selected material.

26. The process of Claim 23 wherein the materials are selected from the group consisting of catalysts and adsorbents.

27. The process of Claim 23 wherein the detecting is accomplished by mass spectrometry.

28. The process of Claim 27 further comprising recording the mass spectrometry determinations using a microprocessor.

29. The process of Claim 23 further comprising isotope labeling at least a first component of the feed fluid.

30. The process of Claim 29 further comprising determining the quantity of at least one isotope labeled component of the effluent.

31. The process of Claim 30 further comprising determining kinetic information from the quantity of at least one isotope labeled component of the effluent.

32. The process of Claim 23 wherein the feed fluid contains at least carbon monoxide and water and the materials of the array are potential water-gas shift catalysts.

33. The process of Claim 23 wherein the membrane is maintained at a lower temperature than that of the selected material.

34. The process of Claim 23 further comprising maintaining the overall cell at a selected temperature.

35. The process of Claim 23 further comprising repeating steps b)-d) one or more additional times.

36. The process of Claim 35 further comprising comparing the results of the repetitions to determine the effect on the materials with exposure to the feed fluid over time.

37. The process of Claim 23 further comprising determining, using the detections of components, information regarding a characteristic selected from the group consisting of activity, selectivity, adsorption capabilities, desorption capabilities, mechanisms of reactions, kinetics of reactions, material formulation optimization, and process conditions optimization.

38. The process of Claim 23 further comprising contacting the array of materials with a pretreatment fluid prior to contacting with the feed fluid.

39. The process of Claim 38 further comprising heating the array of materials, sequentially or collectively, during the contacting with a pretreatment fluid.

40. The process of Claim 23 further comprising diffusing the feed fluid prior to contacting with the array of materials.

41. Th process of Claim 40 further comprising maintaining a pressure P_1 of the feed fluid prior to dispersion, maintaining a pressure P_2 in a portion of the cell containing the array of materials, and maintain a pressure P_3 of the sequential sample streams, where $P_1>P_2>P_3$.